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ABSTRACT

Dynamic Learning Communities (DLCs) offer an alternative approach to the traditional Instructional Design (ID) format for learning. This paper outlines the concept of a dynamic learning community as an alternative to teacher-controlled or pre-designed instructional systems. DLCs are groups of people, who form a learning community generally characterized by distributed control, commitment to generation and sharing of new knowledge, flexible and negotiated learning activities, autonomous community members, high levels of interaction, and a shared goal or project. A number of features emerge in DLCs. Positive features include: the capacity to adapt and evolve, creativity and innovation, the crossing of traditional boundaries, the appreciation of diversity and multiple perspectives and member input in diagnosing and addressing groups' learning needs. Short-term inefficiencies and lack of predictability can be serious drawbacks, however. Three scenarios are observed where DLCs are beginning to take root: workplace learning, academic culture, and Internet discussion groups. In observing these groups, seven steps common to the CLC process are identified: (1) articulate the learning need; (2) seek help in a group format; (3) engage in help consultation; (4) assess learning; (5) share the solution with the group; (6) archive for future reference; (7) repeat this process to support learning. Traditional instructional design and DLCs can both lead to learning. (Contains 17 references.) (SWC)

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Title:

Dynamic Learning Communities: An Alternative to Designed Instructional Systems

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In the wake of the constructivist movement in psychology and education, the field of instructional design (ID) is reexamining its relationship to learning and instruction. Many ID theorists are calling for more situated approaches to the design of instruction, encouraging teachers and local groups to take ownership of the design process and adapt their methods and goals to the needs of students and stakeholders (e.g., Wilson, Teslow, and Osman-Jouchoux, 1995). Others have defended traditional views of instructional design as a prescriptive science, charged with developing universal methods and strategies that will result in effective, efficient instruction (Merrill, Drake, Lacy, & Pratt, 1996).

The problem is exacerbated by the growing negative connotation of 'instruction.' To many constructivist educators, what they are trying to accomplish with students cannot be captured by 'instruction.' Instruction is typically thought to have clear, prespecified learning objectives, teacher-determined activities and instructional strategies, and clear boundaries in time and space. What happens when learning happens, but not in such clearly directed, controlled terms? ID theorists are examining alternate metaphors such as "learning environments" to understand and describe learning where the learner assumes more direction and control over goals, content, and methods (e.g., Wilson, 1996).

The idea of "learning communities" has also been discussed as an alternative metaphor to traditional instruction. What happens when groups of people gather together to provide mutual support for learning and performance? How would that work? Rather than being controlled by a teacher or an instructional designer, learners might "self-organize" into functioning communities with a general goal of supporting each other in their learning. That is to say, the function of guidance and control becomes distributed among group participants. Specific roles of group members are not assigned but rather emerge from the interaction of the whole.

This paper is our initial effort to outline the concept of a dynamic learning community as an alternative to teacher-controlled or pre-designed instructional systems. We argue that dynamic learning communities constitute an important alternative to specifically designed instructional systems, and that communication technologies can serve to support learning communities in their efforts. We present below an outline of our current thinking. For future papers, we intend to gather more examples or case reports concerning specific learning communities.

What is a Dynamic Learning Community?

Our definition for DLCs is offered in Table 1. We see DLCs as decentralized groups focused and interacting enough to form a stable community. Let us first unpack the elements of the term:

Communities. Groups become communities when they interact with each other and stay together long enough to form a set of habits and conventions, and when they come to depend upon each other for the accomplishment of certain ends.

Learning communities. In truth, all communities learn. One of the lessons of postmodernism and situated cognition is that learning cannot be separated from action. We are learning every day, in everything we do. We add the qualifying term to our definition to suggest a community sharing a consensual goal to support each other in learning. Everybody expects to learn and is prepared to engage in activities at least partly for that reason. This would distinguish learning communities from those solely concerned with entertainment, political action, or the performance of an immediate task. We would note, however, that groups can have complex agendas, and that a group may have multiple goals that are commonly shared throughout the membership, such as supporting both work performance and learning among its members.

Dynamic learning communities. The term 'dynamic' is added to distinguish the construct from traditional, centralized groups of learners found in many classrooms. In a dynamic community, all members share control, and everyone learns, including the "teacher" or group leader (cf. Wilson & Cole, 1997; Scardamalia & Bereiter, 1994). Transformative communication is the norm, wit both sender and receiver of messages changed by the interaction (Pea, 1994). Thus a classroom wherein the teacher assigns a project, expecting the students to learn something but not expecting herself to learn—such a classroom would not yet be a dynamic learning community because all participants are not engaged in the learning experience.

Dynamic learning communities (DLCs) are groups of people who form a learning community generally characterized by the following:
—distributed control;
—commitment to the generation and sharing of new knowledge;
—flexible and negotiated learning activities;
—autonomous community members;
—high levels of dialogue, interaction, and collaboration;

—a shared goal, problem, or project that brings a common focus and incentive to work together.

We would expected to see the following additional characteristics over time:
POSITIVE OUTCOMES
—capacity to adapt to local conditions and evolve over time;
—creativity and innovation;
—crossing of traditional disciplinary and conceptual boundaries;
—appreciation of diversity, multiple perspectives and epistemic issues;
—community members who are responsible and skilled at diagnosing and addressing their learning needs;
NEGATIVE OUTCOMES
—occasional inefficiencies;
—lack of control;
—lack of predictability.

Table 1. Definition and characteristics of dynamic learning communities (DLCs).

DLCs are the sort of open, adaptive system described by Kevin Kelly in his book *Out of Control* (Kelly, 1994). Open systems are defined by "(1) the absence of imposed centralized control; (2) the autonomous nature of subunits; (3) the high connectivity between the subunits, and (4) the webby nonlinear causality of peers influencing peers" (Kelly 1994, p. 22, reformatted).

According to complexity theorists (see also Gleick, 1987; Hayles, 1991; Prigogine & Stengers, 1984; Waldrop, 1992), a complex, adaptive system takes on life-life qualities such as intelligence, intentionality, self-correctability, and self-preservation. Examples of complex systems include the stock market, ecological systems, and living organisms. Similar qualities of intentionality and adaptivity should emerge in a learning community if they have the characteristics noted in Table 1 and further discussed below.

Distributed control. In a typical classroom, the teacher is in charge. The teacher makes all the important decisions, such as what to teach and how to teach it. In a DLC, nobody is in control—everybody is! Conventions, shared understandings, rules for settling disputes or for governing communications—All of these are negotiated and agreed upon by the group as a whole. So are learning goals and methods. If one member has a different vision for where the group should be going, this is presented to the group and discussed. The community is bigger than any single member, yet it encompasses the perspectives of all members.

Commitment to the generation and sharing of new knowledge. Everybody learns. Nobody stands apart, pulling the strings for the sake of the others. By sharing, listening, imitating, and watching, all members of the learning community benefit. Those with greater expertise play critical roles in helping and modeling, yet they are expected to learn, solve problems, find answers, right along with the rest of the group.

Flexible and negotiated learning activities. Specific learning goals and activities largely "happen." There is a sort of natural selection of activities—Those that are successful and lead to learning are repeated and developed and shared, while those that are not supported by the group fall into disuse. This can lead to inefficiencies and a meandering process of development, but it can work.

Autonomous community members. One of Kelly's key components of complex systems is that of "autonomous agents"; that is, community members must have a certain room to direct their own activities and make decisions. There needs to be room for variation and differences among community members; otherwise the system devolves down to a single controlled perspective.

High levels of dialogue, interaction, and collaboration. High levels of connectivity are essential to complex systems and to DLCs in particular. A neighbor may be doing great things, but if that information is not shared via constant communication, then other community members will not be aware of it. Information is what drives the feedback loops that lead to new learning and change in the overall system.

A common focus and incentive to work together. DLCs need a reason to exist. This may come from shared interests, or a common goal, problem, or project. Outside constraints, such as market or job demands, may provide an incentive for a group to form. Work groups may be motivated to keep their jobs. The free market of Internet listservs may allow communities to coalesce around very localized interests, such as breeding border collies or following the fortunes of an NFL franchise. Public-school students may converge on a project or major assignment, such as a yearbook or newspaper. Students in Carnegie-type classrooms may be hard-pressed to find a threshold of common purpose sufficient

to create a truly dynamic learning community. Certainly such a concept competes with the bulk of school conventions and cultural forms.

Consistent with other complex systems, we would expect to see a number of additional features emerge in DLCs, some positive and some negative. These are briefly discussed below.

POSITIVES

Capacity to adapt to local conditions and evolve over time. Because DLCs depend upon each member for information, DLCs should be able to pick up on changes in the environment more quickly than controlled instructional groups. Behavior of DLCs are more fluidly defined and more flexible than fixed-goal and fixed-strategy systems, allowing easier adaptation and change over time.

Creativity and innovation. DLCs will tend to be more pluralistic than instructional systems because behavior is not centrally controlled. Much variant behavior may prove unfruitful, but in amid the diversity, some ideas will show promise. Thus creativity, change, and innovation should be more prevalent than in instructional systems. The DLC may experience more failures, but more innovative successes as well.

Crossing of traditional disciplinary and conceptual boundaries. Typically, a DLC cares less about its disciplinary base than the problem it is trying to solve.[14] Workers from a variety of backgrounds, for example, may form a DLC if they face a common challenge or problem. Each person brings the baggage of their prior experience, and each submits to being influenced by the community. The cross-fertilization that results can lead to new categories and new perspectives not previously perceived by established communities.

Appreciation of diversity, multiple perspectives, and epistemic issues. Expertise is inherently multi-perspectival in a DLC. Members come to respect knowledge that comes from a variety of sources—people of different backgrounds and information of different types. Likewise, community members develop their own methods for testing proposed knowledge against a variety of standards and codifying that knowledge in a way that can be shared throughout the group and across situations and time. The upshot of this diverse environment is that community members progress in their epistemic understanding, perhaps moving from black-and-white views of knowledge toward more sophisticated views of how we come to know things.

Community members who are responsible and skilled at diagnosing and addressing their learning needs. Here is both a benefit and a challenge to DLCs. When control is distributed throughout the group, more demands are placed on individual members. Because teacher is no longer doing the hard work of deciding on goals, methods, and new knowledge, community members must meet the challenge of assuming these roles. Metacognitive knowledge—knowing how to monitor one's learning and how to address ill-defined problems—becomes an essential part of the community, which hopefully can also be shared throughout the group. A systemic analysis may conclude that a given group cannot become a DLC because of deficiencies in this area. On the other hand, a group may progress incrementally in these skills and move steadily toward more self- (or community-) directed learning.

NEGATIVES

Short-term inefficiencies. Just as a Vermont town meeting can be more laborious and inefficient than a professionally managed city's well-defined processes, so DLCs can be more inefficient and indirect than controlled instruction. A well-packaged instructional program may be able to teach a fixed set of rules more efficiently. If such a product were reliably available, then a DLC would be wise to recommend its use. In the absence of such structure, however, DLCs may tend to "muddle through" (cf. Bateson, 1972, pp. 3–8) with its share of redundancies, inefficiencies, lack of focus, and lengthy processes.

In the long term, however, DLCs may be an efficient route toward learning. A cow does not look for the shortest route up a hill, but rather keeps its head down and looks for a steady way up without noticeable climbing. The result is the most efficient use of its energy (Allen, 1996). DLCs will tend to meander. But like the cow up the hill, the shortest path may not always be the wisest path, and certainly not the most efficient path.

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[14]Note our attribution of intentionality to the DLC (it "wants" this or "seeks" that). This issue is somewhat controversial; for example, Bateson (1972) avoids such language because it leads to a category error—thinking that systems have a mind in the same way humans do. Part of our message, however, is that complex systems *do* seem to have minds of their own; that is, they come to behave as though they had intentions. Whether this crosses a boundary of appropriate discourse, and moves into an anthropomorphic error, we will speak of systems as having intentionality because it is a useful shorthand for understanding complex systemic behavior.

Lack of control. DLC's decentralized control can be a handicap. The leadership and vision of a charismatic leader can marshal community resources and stimulate purposive action. At times, the unwieldiness or fuzziness of a DLC can frustrate those who would like to see decisive action or clear direction for learning.

Lack of predictability. DLCs can frustrate the intentions of the best designers. A constant among initiators of DLCs is the reported surprise at the direction the group takes. DLCs seem to have a mind of their own, and where they end up is not where they start. This is true of distance-learning groups, workgroups, and learning communities within classrooms. Often the surprises are pleasant, but the evolving nature of the group can be difficult for people trying to plan for the future.

In one sense, DLCs can be thought of as being learner-centered. Community members must take more responsibility for their own learning than in most designed instructional systems. In another sense, however, the "centeredness" is found in the community rather than the individual learner. Ideally, community members lacking metacognitive skills may participate and receive support from the group. The group often dictates the learning agenda—or at least engages individuals in dialogue concerning that agenda. The thought of individuals isolated, setting individual goals, pursuing those learning goals individually—This is contrary to our conception of a dynamic learning community. So we tend to think of DLCs not simply as tools for self-directed learning, but as supportive communities wherein a variety of learning goals may be pursued, some individual and some shared throughout the membership.

Three Scenarios

In this section, we present three scenarios we have observed, where dynamic learning communities (or DLCs) are beginning to take root.

Workplace learning. Martin works with a group of engineers charged with developing new products and specifications for supporting those new products. Martin finds himself working on products whose standards have not yet been finalized, which in any case will be replaced within 18 months by another standard or a newer, more capable product. When a standard doesn't exist, where does an engineer go to get answers? Off-the-shelf training is no help except for generic skills. Customized training products such as computer-based training take too long too develop and would not be cost-effective for the specialized needs of the small engineering workgroup. Hiring a consultant/trainer to come from the university and give lectures is a possibility, but often the expertise is not available, and when it is, the costs of pulling people away from their work in a high-pressure environment can be enormous. Even traditional performance support systems—electronic or otherwise—exact a toll in time and effort. These systems must be designed, and therein lies the problem: nobody knows enough to design them, and if they did, they would be too busy putting out immediate fires to take the time. In short, expertise is scarce and doesn't exist in any form specifically designed for instruction or support.

As an alternative to traditional training and performance-support solutions, Martin has been promoting the concept of shared problem solving and archiving of solutions. When an engineer needs help, she asks for help among the workgroup. If someone has an answer, the solution is shared publicly and archived for future reference. Getting engineers to think in terms of mutual, collaborative support is a challenge, but given the pace of change and the demands for expertise, they really have no choice. They must learn to share expertise, or they will not survive in their competitive environment. This general approach of mutual support for learning is further discussed in later sections of the paper.

Academic culture. What is an academic program? Is a masters program the sum of courses required of students for the degree, or is it something more? How does an academic unit's local culture serve to encourage learning—within classes, on collaborative projects, or among individual students and faculty? Brent has been reflecting on ways that students, faculty, staff, friends, and alumni all work together to foster learning and professional growth. The communications infrastructure provided by e-mail and the World-Wide Web can serve to facilitate higher levels of connectivity and participation and new learning.

In the case of higher education, faculty members benefit as much as students from the interaction and sharing of expertise. Because faculty members do not typically return to school for more degrees, they rely on professional interactions—including stimulus from students—as a key resource for new learning.

For the last couple of years, Brent and colleagues have been exploring ways to strengthen the collaborative sharing and out-of-class learning that naturally occurs in and around the academic program (see Wilson, Ryder, McCahan, & Sherry, 1996 for a report of their work). Students with resources of their own become less dependent on professors and courses as sources of expertise, and move toward a wider variety of learning activities and interactions. Over time, these informal interactions come to constitute a learning community, and become as important to the education of participants as formal courses.

Internet discussion groups. Globally, a swell of informal or distributed learning initiatives have taken shape, using the Internet as its medium. Indeed, the Internet serves as a sort of "petri dish" wherein a variety of informal cultures have begun sprouting up. Many of these learning initiatives are independent of traditional instruction. Participants in a listserv such as IT Forum, for example, may engage in high-level discussions concerning technology in education, yet their participation may not be reflected in course credit and may not be governed by a teacher or instructional designer (Rieber, 1996). People may especially benefit from participating on global forums when expertise is rare within their local environment. In a way, the monopoly of expertise is being shaken loose from the universities, big businesses, large cities, and developed countries, and is being distributed throughout the world via the Internet. The opportunities afforded by new communications technologies will eventually have profound implications for how we think about learning and instruction.

The DLC Learning Process: The Dialogical Case

Learning can happen in a variety of ways within a DLC; however, a pattern of mutually support will tend to emerge, outlined in Table 2 below. Each step is described in turn.

1. Articulate the learning need. This becomes the learning "problem" or goal.
2. Seek help in a group forum.
3. Engage in a help consultation.
4. Assess learning.
5. Share the solution with the group. Restate the problem and solution if necessary.
6. Archive the interaction or the restated solution for future reference.
7. Repeat this process, of any part, as necessary to support learning.

Table 2. A dialogical approach to learning within DLCs.

Articulate the learning need. A community member becomes aware that she or he lacks some skill or knowledge. The learning need may not be fully analyzed; that is, how the needed knowledge relates to a particular problem or performance need not be fully specified at the outset. The need to know becomes a "problem" or learning goal for the individual.

Seek help in a group forum. The community member then seeks help, often in a public forum, such as a distribution list or listserv maintained by the DLC.

Engage in a help consultation. Another community member helps or consults with the first member. Help consultations may draw on a variety of resources:

—human resources;
—archived interactions;
—FAQs;
—information search tools;
—performance supports;
—instruction.

Community members may discuss the issue at length, publicly—Or the help consultation may be simple, direct, and private.

Assess learning. Community members have a variety of tools to use in testing out new knowledge or skill. If the help consultation provides incomplete information, the community member may succeed in filling in the missing information. A recommended procedure can be tried out; if it fails and the problem can't be solved, the person goes back and reports the problem and repeats the interactive process. If new knowledge is offered, it is tested against prior knowledge and understanding. New knowledge can also be compared across members of the group. Typically, a combination of self-assessment and consensual agreement is the norm.

Share the solution with the group. After new knowledge or skill is tried out and confirmed, the solution is shared with the group. A restatement of the original problem and its solution may be helpful, especially for future reference.

Archive for future reference. Ideally, every DLC interaction should be archived for future retrieval. If an automatic archiving system is not in place, then each solved problem or significant interaction should be stored in a public location for future access by any member of the group.

Repeat as necessary. Although listed in steps, the general process is flexible. Any step or set of steps may be repeated in the process of generating solutions to learning problems.

The process above typifies interactions where a specific learning need is identified. A common alternative is the kind of informal discussion characteristics of many listservs and discussion groups. Frequently, knowledge sharing is not problem-driven but rather conversation-driven. In those cases, the learning activity is less strategic and less defined, but learning is nonetheless supported by mutual sharing and concern around a topic of interest.

MANAGING EXPERTISE IN THE DLC

One challenge DLCs have is keeping both experts and novices happy interacting within the same group. Novices have a tendency to ask inappropriate questions and to not use the full resources available to them. Experts can feel overworked, exploited, or unchallenged—feeling that they aren't learning anything. How does a learning community deal with the varying needs of its members? Before we specifically address this question, a few general comments are in order.

Expertise is relative and multi-faceted. Expert and novice roles fluctuate within the community. Brent is an expert at one thing, Martin at another. Some members may be expert at group cohesion, serving a critical support role in keeping the community together. Others may participate irregularly, but have important input at certain junctions. Certainly labels such as "expert" or "novice" do not capture the richness of the expertise that is distributed throughout a learning community.

There must be a legitimate self-interest to sustain individual participation. At the individual level, community members must each feel a personal return on their investment in the group. In this sense, a perceived self-interest must accompany continuing involvement with the community. There are, however, a number of grounds for self-interest. Some people get tremendous satisfaction out of helping others. Some people like to think of themselves as being a source of expertise to others. Some people have a need to feel connected to groups of people, even when significant new learning happens only irregularly. Some people develop a sense of loyalty and constancy, committing time and resources to a community because it helps them find a "home." All of these may be reasons why a person with considerable expertise may choose to participate in a diverse learning community.

Martin has an example from engineering. An Internet discussion list exists around new standards for the next generation of the SCSI interface. List members have a variety of motives for participating. A sales and marketing person may feel like a novice, with a need to upgrade his understanding of technical details. An experienced engineer may participate because she feels a need to maintain a link to "people out there" and understand people's reactions to proposals and possibilities. This knowledge will then help her in establishing better standards. The list thrives because people depend upon each other and need the different kinds of expertise available among the group.

We return again to the different needs of novices and experts within learning communities. Novices often feel intimidated, or may tend to under-utilize available resources, while experts' time is often overtaxed with questions and service demands, leaving little time for the renewal of their own expertise. We offer several possible strategies that DLCs might choose to adopt in addressing the general problem, summarized in Table 3 below.

For Everyone:
• Varied levels of discussion and activity (e.g., beginners vs. advanced)
• A process that inducts beginners and moves them through increasing levels of expertise
• Moderated lists
For the Expert:
• Public and private accounts
• Allowing anonymous posts
• Private groups
• Temporary consultations, participation
For the Novice:
• User-friendly search and navigation tools
• Private consultations and re-directions
• Paid advisors/help specialists (e.g., AOL guides)
• Standard problem-solving protocols (e.g., "have you read our FAQ?")

Table 3. Possible strategies for managing expertise within dynamic learning communities.

The strategies suggested in Table 3 are possibilities only. Several would curtail or constrain free interaction within the group, thus inhibiting the "dynamic" nature of the learning community. Care should be taken not to fix a problem that

doesn't exist. Specific policies can best be determined by consensus among the local community, and evolve over time as needs change.

ID VERSUS DLCs?

Both instructional design (ID) and DLCs can lead to learning. However, other things being equal, we believe that open systems are preferred because they address more fundamental learning outcomes, e.g., self-directed inquiry, learning-how-to-learn, metacognition, etc., and are more closely situated within a natural performance environment. The following table presents an outline of variables to consider when choosing between DLCs and designed instructional systems.

Use Instructional Design if these conditions apply: • stable content over time; • well-defined content; • best for algorithms and rules; • heavy representation demands; • mastery of discrete knowledge is valued. Try DLCs if these conditions apply: • volatile, changing, or new content; • ill-defined content; • best for complex problems and content; • heavy literacy and metacognitive demands; • community-directed, situated support for learning is valued. The following are relevant (but NOT determining) factors: • level of expertise; • criticality of content.

Table 4. Factors to consider when deciding between designed instruction and dynamic learning communities.

Note that the criticality of the learning or the advancedness of the skills are not determining factors when deciding between designed instruction and DLCs. That is, DLCs can be effectively used at varying levels of expertise, and with critically important content. Where certification of expertise is necessary, however, individuals should demonstrate their expertise using accepted assessment methods, regardless of the method of learning support.

In general, the more stable, defined, and discrete the content, the more sense to design instruction to meet the learning need. Contrariwise, the more volatile, ill-defined, and complex the learning needs, the more sense to try dynamic learning communities as a support strategy.

In the end, the decision between designed instruction and DLCs is partly one of utility and partly one of value. That is, given the same ends, DLCs may prove more or less effective in accomplishing learning. Seen in this way, the issue is one of utility. Taken the next level, however, designed instruction cannot be said to accomplish the same ends as DLCs, and vice versa. At this point, the decision necessarily rests on the question: What learning ends do we really value? Members of dynamic learning communities will come out of their experience with different skills, perspectives, and appreciations than graduates of an instructional program. These differences must be respected and considered when choosing between approaches to learning support—in addition to the utilitarian considerations mentioned above.

Costs. Traditionally designed instruction requires relatively low investment to establish the culture because most school and training cultures are already in place. However, heavy investment is required for each new instructional product and for continuing delivery of instruction. DLCs, on the other hand, require heavy front-end investment to establish a culture and support new users. Once users become experienced, the costs can be expected to be lower. At this point, we really don't know enough about cost comparisons to make definitive judgments. More data on this subject will be helpful as DLCs become more heavily used and studied.

CONTROL OF DLCs

As we made emphasized above, because DLCs are open systems, control is distributed throughout the community. This can be both a strength and a weakness. Examples of problems that can arise include:

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—pornography access in a middle school;
—bomb-assembly instructions two or three links away from your homepage;[15]
—competitor "air space" on company-sponsored net;
—flaming and dissent on discussion groups;
—addictive and inappropriate behaviors;
—mismatch between DLC learning and externally-defined curriculum objectives.

Deciding how to deal with these kinds of problems brings us back to the core differences between open learning systems and closed instructional systems. We may choose to respond to problems by seeking to limit the openness of resources available to a DLC. Possible methods for exerting some measure of control over DLCs include:

—list moderation;
—control over membership;
—externally mandated rules and conventions;
—imposed problems or learning activities;
—imposed assessment standards.

Such attempts are controlling DLCs constitute a compromise of their open nature. Thus the learning community becomes something of a hybrid between a DLC and a designed instructional system. Such compromises may be necessary in schools or other real-life settings, but they should be implemented very carefully, since interventions can have unpredictable effects on group functioning. This again is another area that we know very little about, in need of further research.

Conclusion

Heretofore, instructional designers have thought they were in the business of designing instructional systems to meet prespecified learning objectives. But first the constructivist movement—and now communications technologies themselves—seem to be threatening this conception as the sole way to support learning. People are learning without help from designed instruction! In many settings, in fact, "natural" learning is more prevalent than "designed" learning (Resnick, 1987). We believe that the situation requires a reexamininationof our core roles. Are we in the business of designing instruction or are we in the business of supporting valuable learning, wherever it may happen? The answer to this question will result in either a narrow or broad interpretation of our role and its relationship to non-instructional forms of learning.

Our own belief is that dynamic learning communities are proper objects of study. We should seek to understand how such communities function, how they grow, how they can be nurtured, and how they can be replicated across diverse settings. But nurturing is different than designing. We must respect the integrity of the community. In time, we may come to think of ourselves more as "learning technologists" than as "instructional technologists", and "learning support specialists" more than "instructional designers." But these are issues best addressed at length in a separate paper.

In conclusion, the development of new communications, storage, and representation technologies constitute a watershed in the history of open learning environments, making DLCs more feasible than they have been in the past. This is a situation where the technology allows a concept to take shape, and the interplay between technology and theory will likely continue in the years to come.

The decision rule concerning DLC versus ID may slide toward DLCs as we learn more about what works. In particular, we need to better understand how established instructional systems (e.g., school classrooms) can migrate toward greater openness, eventually resulting in a displacement of instruction for a community model. A transition model that outline this growth trajectory would be a most welcome research agenda in the coming years.

In the meantime, we will continue studying how dynamic learning communities take shape, how they self-organize, and how they support learning. Documenting cases empirically is an important part of that agenda, and will help to clarify several issues merely touched on in this paper.

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[15]This example comes from our own experience maintaining IT Connections (http://www.cudenver.edu/~mryder/itcon.html). In response to a student's complaint, we could only shrug our shoulders and mumble something about the wonders of an open system!

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